

Section 5.1: Solving Linear Systems by Graphing EXAMPLES

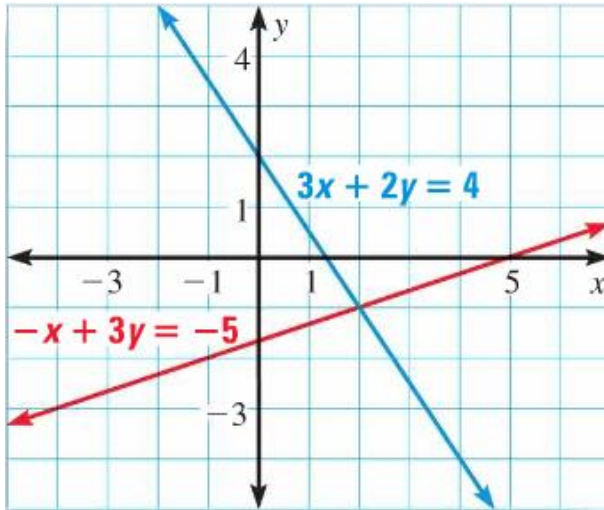
EXAMPLE 1: Decide whether the ordered pair is a solution of the system of linear equations.

If it's a solution, it has to work in BOTH equations

1) $\begin{cases} x + 3y = 15 \\ 4x + y = 6 \end{cases}$ (3, -6)

2) $\begin{cases} -5x + y = 19 \\ x - 7y = 3 \end{cases}$ (-4, -1)

EXAMPLE 2: Use the graph to solve the system of equations. Then check your solution algebraically.

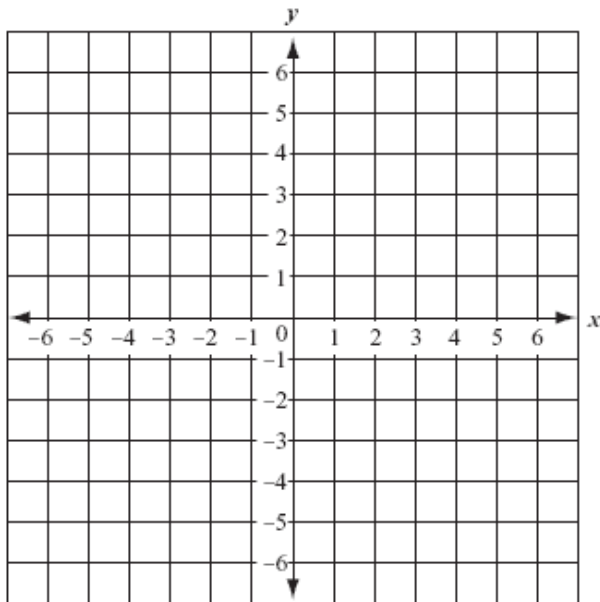


The solution is: _____

Check Solution

Remember! The solution to a system is the point where the lines intersect.

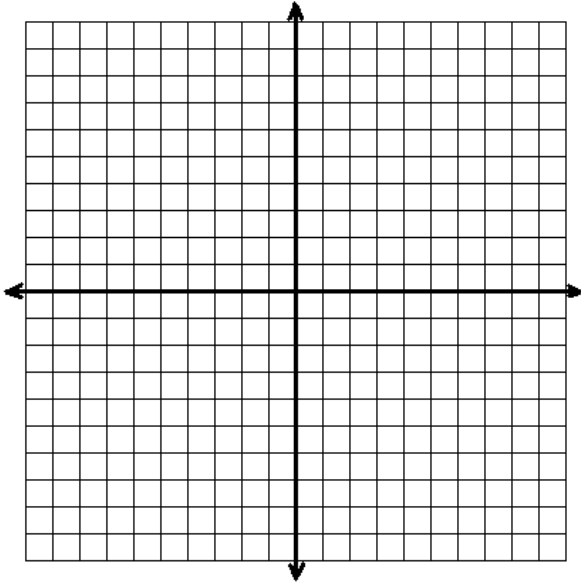
EXAMPLE 3: Solve the linear system graphically. Check the solution algebraically (aka check your answer!)



$$\begin{cases} y = \frac{1}{2}x - 3 \\ y = -2x + 2 \end{cases}$$

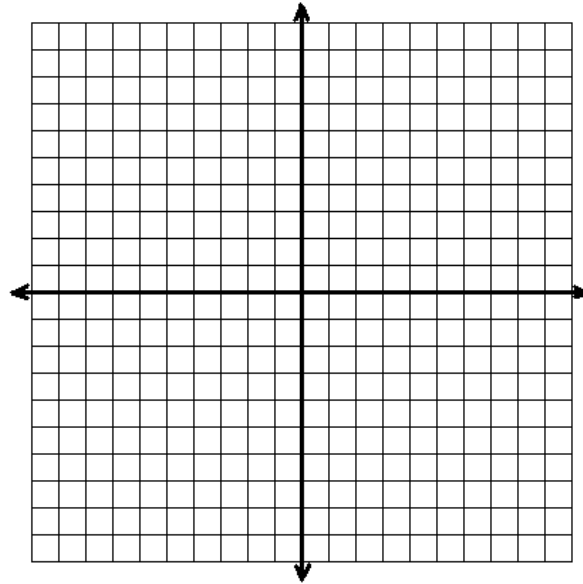
Remember! You should label each line with the equation so you know which line is which.

$$\begin{cases} y = 2x - 9 \\ y = \frac{2}{3}x - 1 \end{cases}$$

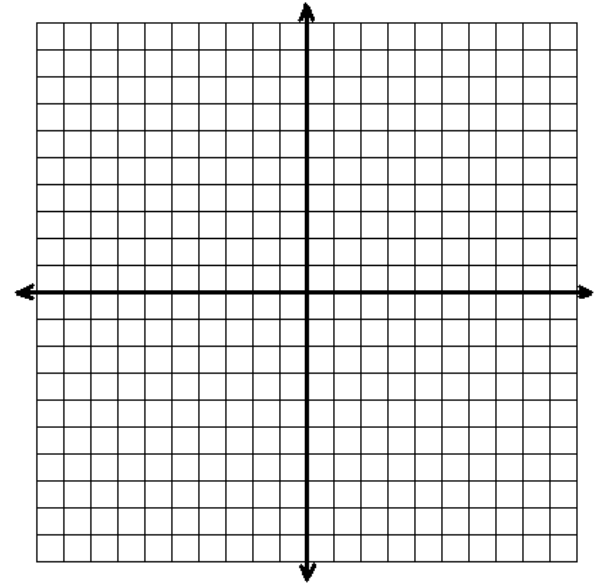


You'll need lined paper to check your answers!

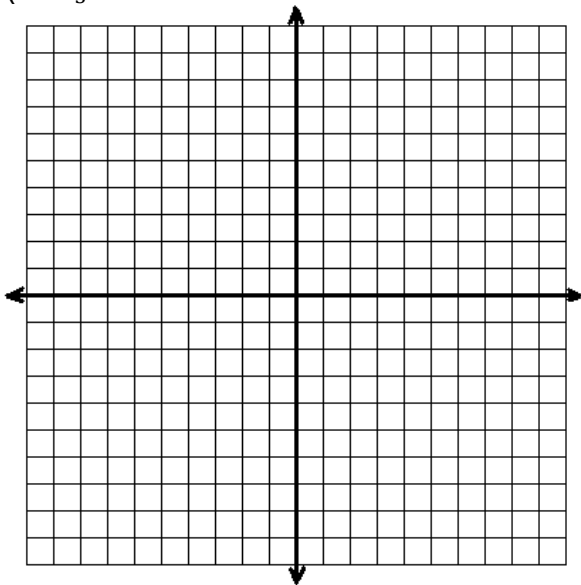
$$\begin{cases} y = x - 2 \\ y = x + 5 \end{cases}$$



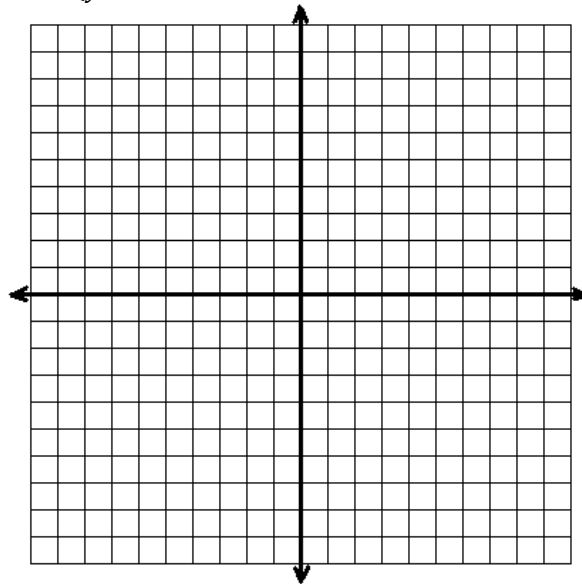
$$\begin{cases} y = 0x + 2 \\ y = -\frac{1}{2}x - 2 \end{cases}$$



$$\begin{cases} y = \frac{1}{3}x - 5 \\ y = \frac{1}{3}x + 0 \end{cases}$$



$$\begin{cases} y = \frac{1}{4}x - 2 \\ y = -4x + 8 \end{cases}$$



If the lines intersect: _____

If the lines are parallel: _____

★ If you get one solution, check your answer!

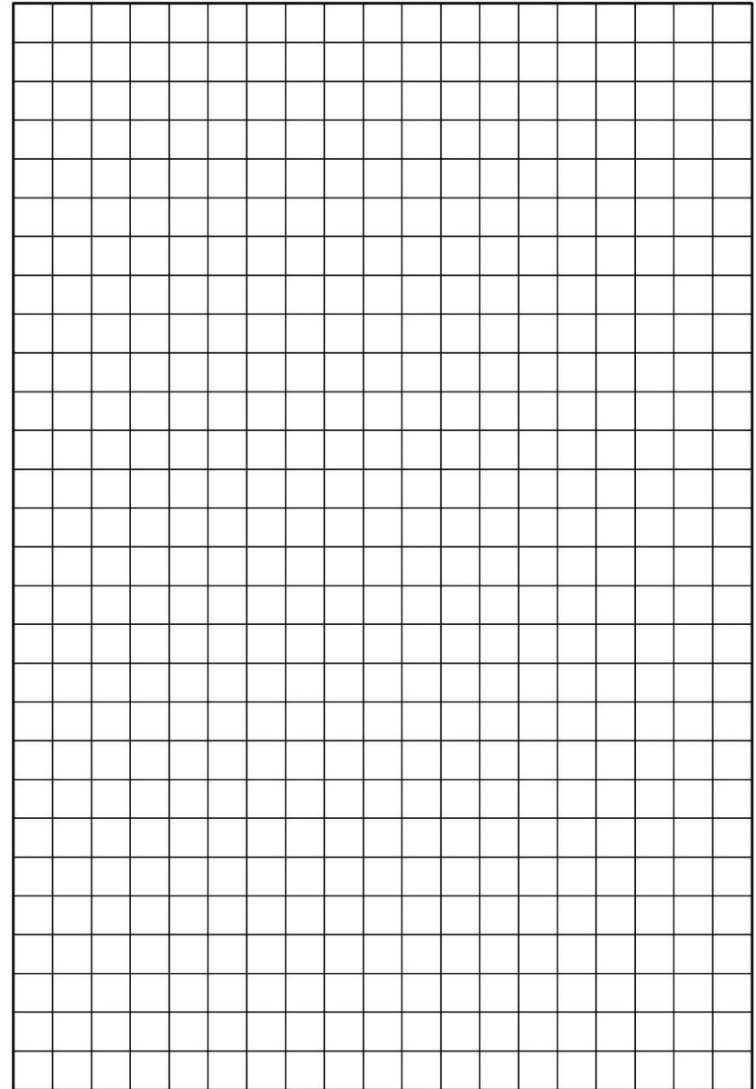
EXAMPLE 4: Write and use a system of equations for the given problem

In the fall, the math club and the science club each created an Internet site. You are the webmaster for both sites. It is now January and you are comparing the number of times each site is visited each day.

Science: There are currently 400 daily visits and the visits are increasing at a rate of 25 daily visits per month.

Math: There are currently 200 daily visits and the visits are increasing at a rate of 50 daily visits per month.

Predict when the number of visits at the two sites will be the same



Homework:

**Must complete #11 – 16 on LINED PAPER.

CHECKING FOR SOLUTIONS Decide whether the ordered pair is a solution of the system of linear equations.

11. $3x - 2y = 11$
 $-x + 6y = 7$ $(5, 2)$

12. $6x - 3y = -15$
 $2x + y = -3$ $(-2, 1)$

13. $x + 3y = 15$
 $4x + y = 6$ $(3, -6)$

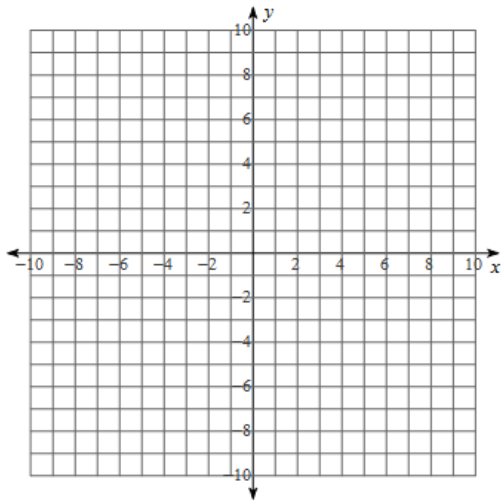
14. $-5x + y = 19$
 $x - 7y = 3$ $(-4, -1)$

15. $-15x + 7y = 1$
 $3x - y = 1$ $(3, 5)$

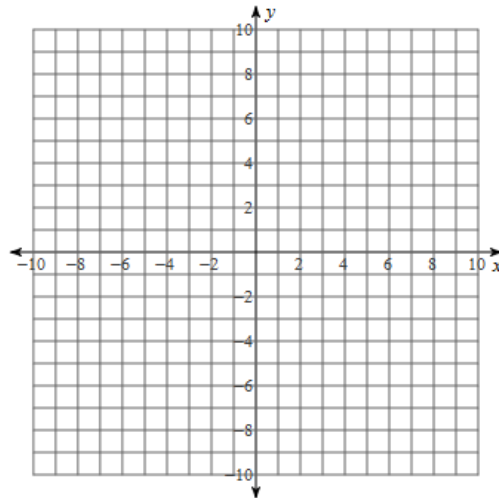
16. $-2x + y = -11$
 $-x - 9y = -15$ $(6, 1)$

Solve each system by graphing.

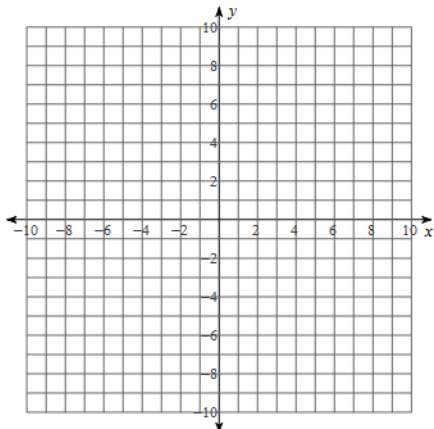
1) $y = -\frac{8}{7}x - 9$
 $y = x + 6$



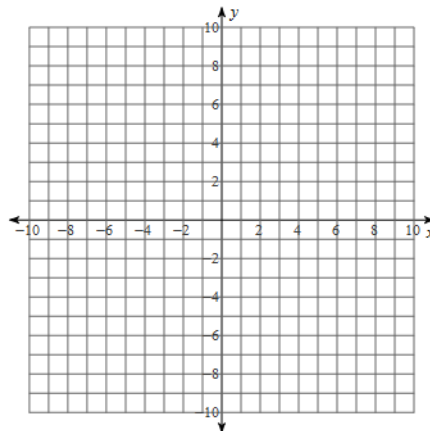
2) $y = \frac{2}{3}x + 3$
 $y = -\frac{1}{3}x - 3$



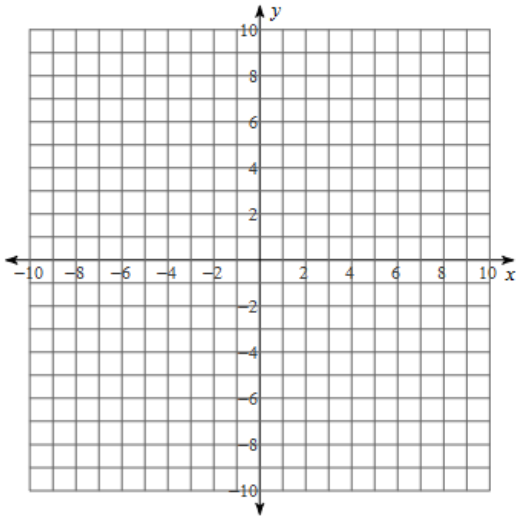
3) $y = \frac{14}{3}x + 7$
 $y = \frac{1}{3}x - 6$



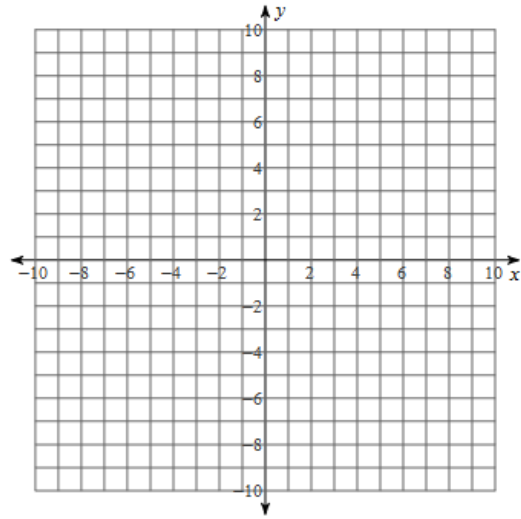
4) $y = -3$
 $y = x + 1$



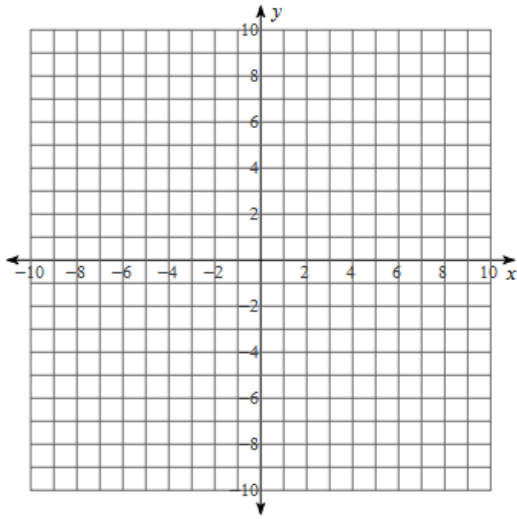
5) $y = x - 2$
 $y = x + 4$



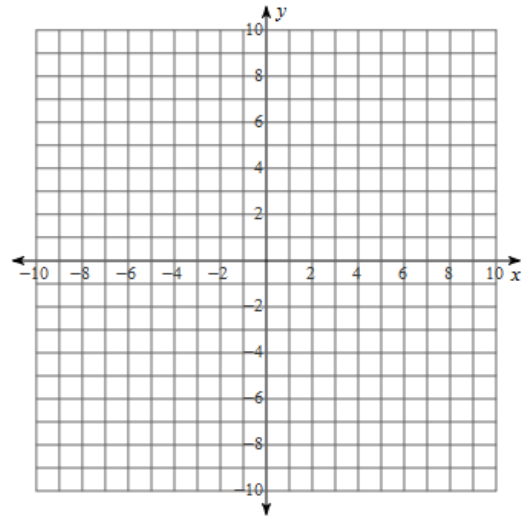
6) $y = x - 3$
 $y = -2x - 6$



7) $y = \frac{1}{3}x + 7$
 $y = 5x - 7$



8) $y = -7x - 9$
 $y = -7x + 5$



9. A fitness club offers two Crossfit classes. There are currently 40 people attending the morning class and attendance is increasing at a rate of 2 people per month. There are currently 22 people attending the evening class and attendance is increasing at a rate of 8 people per month.

- a. Write two equations to model the situation.
- b. Graph both equations.
- c. Use the graph to predict when the number of people in each class will be the same.

